The Journal of Phytopharmacology
(Pharmacognosy and phytomedicine Research)

A prospective study of prathisaraneeya apamarga kshara in comparison with prathisaraneeya palasha kshara in patients with charmakeela (warts) and kadara (corns)

Vijayshankar B.V, Muralidhara Sharma, Chandrashekar R*, Manohar V.R

Abstract

Background: Charmakeela and Kadara are the diseases which have signs and symptoms similar to Warts and Corns respectively. Objectives: Kshara karma is mentioned under kshudra roga adhikaras by Acharya Sushruta under the context of Kshara karma adhyaya for the treatment of Charmakeela and Kadara. Methods: In our study, clinically diagnosed 30 patients were enrolled and divided into two groups. Out of 30 patients, 15 patients were assigned to Group 1 for prathisaraneeya kshara karma with Apamarga kshara and another 15 patients were assigned to Group 2 for prathisaraneeya kshara karma with Palasha kshara considering its effect on two subjective symptoms (pain & burning sensation) and two objective signs (regression of lesion & discharge) on day one with a follow up treatment on 3rd, 5th and 7th day. Results: Our study had 18 cases of warts and 12 cases of corns respectively. Group 1 had nine patients of warts and six patients of corns respectively. The result of our study reveals that, six patients of warts and four patients of corns had a reduction in pain, burning sensation, discharge and complete regression of lesion. Two patients of warts and one patient of corns had scarring after seven days and one patient each from warts and corn had recurrence in Group 1 after eight weeks, whereas four patients of warts and four patients of corns had complete regression of lesion, three patients of warts and one patient of corn had scarring which was noticed after seven days of the treatment and two patients of warts and one patient of corn had recurrence after four weeks in Group 2. Conclusion: Even though scarring was seen in a few patients, the size of the scar was lesser than the lesion existed before in Group 1 (Pratisaraneeya Apamarga kshara) compared to Group 2 (Pratisaraneeya Palasha kshara). The scar was acceptable by the patients in comparison with the original lesion. Pratisaraneeya Apamarga kshara showed greater improvement in corns and warts when compared to pratisaraneeya Palasha kshara.

Keywords: Charmakeela, Pratisaraneeya Apamarga kshara, Kadara, Pratisaraneeya Palasha kshara.

Vijayshankar B.V
Asst. Professor, Department of Shalya Tantra, J.S.S Ayurveda Medical College, Mysore- 570028, Karnataka, India

Muralidhara Sharma
Professor, Department of Shalya Tantra, J.S.S Ayurveda Medical College, Mysore- 570028, Karnataka, India

Chandrashekar Rs
Faculty, Department of Pharmacology, A.J. Institute of Medical Sciences and Research Centre, Kuntikana, Mangalore 575004, India

Manohar V.R
Professor, Department of Pharmacology, A.J. Institute of Medical Sciences and Research Centre, Kuntikana, Mangalore 575004, India

Correspondence:
Dr. Chandrashekar R
Faculty, Department of Pharmacology, A.J. Institute of Medical Sciences and Research Centre, Kuntikana, Mangalore 575004, India
Email:
chandumoon47@gmail.com

Introduction

Warts, also known as verrucae, are common, benign, viral Human Papilloma Virus (HPV) infections of the skin and adjacent mucous membranes and mode of transmission is through direct contact, but autoinoculation is possible. According to Ayurveda, this ailment can be compared with Charmakeela. The pathogenesis of this disease is due to vitiation of Vata along with Kapha over the skin which causes the development of hard nail like structures called Charmakeela [1-5]. A corn (or callus) most often appears in the center of the paw pad, and presents as a whitish, circular area that can be extremely painful when palpated. Corns can also appear on the sides or the tips of the paw pad, though these are not as common. Corns sometimes appear between the toes which are softer in consistency, but less painful. The reason for the pain is that corns contain a cone-shaped core/root whose point can press on a nerve, causing severe pain and lameness as if one is walking with a sharp pebble in the shoe [6-8]. Kadara (corn), is one of the Kshudra rogas mentioned in Ayurveda, is a horny induration of the cuticle with a hard centre caused by undue pressure chiefly affecting toes and feet [9-12].

Sushruta has basically mentioned four types of treatments, i.e., bheshaja (medicines), ksharakarma (Application of alkali preparation), agnikarma (Cauterization) and Shastrakarma (Surgery) as chikitsopakarma for Asrha (piles) in Sushruta samhitha sutra sthana and he has

given more emphasis on ksharakarma which also holds good for treatment of Charmakeela and Kadara. There are two types of kshara preparation: one is paneeya kshara for internal use while the other one is the prathisaraneeya kshara for external use. The prathisaraneeya kshara is further divided into three types, i.e., Mridu (mild in action), madhya (moderate in action) and tikshna (strong in action) [13].

In this study, tikshna kshara was taken into consideration for local application directly on the Charmakeela and Kadara[14].

Materials and Methods

Institutional Ethical Committee clearance was obtained from Shri Dharmasthala Manjunatheshwara (S.D.M) Ayurveda College Hospital Udupi, Karnataka, India in August 2010. Informed consent was obtained from each patient before enrolling in the study. The study was carried out on out-patient department (OPD) and in-patient department (IPD) from patients suffering from warts and corns, seeking treatment in the Department of Shalya Tantra of S.D.M Ayurveda College Hospital Udupi, Karnataka, India.

Sample Size and Method

Inclusion criteria

- Patients of either sex were selected.
- Patients from age group of 18-60yrs. Patients with Warts and Corns eligible for Kshara karma were considered.

Exclusion criteria

- Warts and Corns present on the sensitive parts like genitals, eye lids, lips, etc were excluded.
- Patients with systemic disease and immune compromised status.
- All the contraindications mentioned by Acharya sushruta, i.e. anahara for kshara karma was excluded i.e. pregnant, children etc.

The enrolled patients were selected according to the selection criteria after thorough examination. A case sheet proforma was prepared accordingly. A Total of 30 diagnosed patients were randomly assigned in to two groups by lottery method as Group 1 one having 15 patients treated with Pratisaraneeya Apamarga Kshara and Group 2 having 15 patients treated with Pratisaraneeya Palasha Kshara.

Preparation of Kshara

Apamarga Kshara and Palasha Kshara was prepared under the guidance of experts as per classical literature as follows

In our study, first we collected fresh kshara from respective plants and converted in to ash, then water was added in the ratio of 1:6 followed by filtration for 21 times again adding powders of sarkara Ksheerapaka (oyester-shell) and Samkhanabhi (core of conch-shell) were added to the boiling ksharajala. Finally chitraka (*Plumbago zeylanica*), danti (*Baliospermum montanum*) and vacha (*Acorus calamus*) etc was added to get tikshana kshara which was taken into consideration in our study for local application directly on to Charmakeela and Kadara.[15]

Procedure

Selected patient was placed in a suitable position depending on the site of the lesion. The area of the lesion (either Wart or Corn) was prepared with antiseptics (Neem oil). The lesion was scrapped with a scalpel and the utmost care was taken that the surface should not bleed. This was followed by application of Pratisaraneeya Apamarga Kshara to Group 1 and Pratisaraneeya Palsha kshara to Group 2. The Kshara was smeared until the lesion was covered completely and left for hundred seconds. After ascertaining samyak dagdha lakshanas like alleviation of the signs and symptoms of the disease, feeling of lightness and stoppage of discharge from site of lesion [15]. Then the site was washed with 10-15ml of nimbu swarasa. Then dried gauze was kept and the treated part was dressed after applying Jatyadhi gritha. The dressing was changed on alternate days throughout the experimental period. The patient was advised to maintain local cleanliness and advised not apply any other local application or any oral medication and come for regular follow up on 3rd, 5th and 7thday.

Assessment Criteria:

The patients were assessed based on subjective parameter (pain and burning sensation) and objective parameter (regression of lesion and discharge) after treatment as follows

Assessment scale:

Pain:

Go - Nil – No pain.
G1 - Mild – Pain that can be easily ignored.
G2 - Moderate – Pain that cannot be ignored, BUT interferes with the normal functions.
G3 - Severe – Pain was present most of the times demanding constant attention.
G4 - Unbearable – Total incapacitating pain.

Burning sensation:

Go- No Burning
G1- Localized and some time feeling of burning sensation.
G2- Moderate and some time feeling of burning sensation.
G3- More localized and often burning.
G4- Continuous burning.

Objective:

Size (Regression-reduction in size of lesion):

Go- No lesion.
G1- Radius less than 0.25cms- 0.25cms
G2- Radius measuring about 0.5 cms – 1cms.
G3- Radius measuring about 1.1 cms – 1.5 cms.
G4 -Radius measuring about 1.6 cms and more.

Note: The lesion was measured by placing Over Head Projector sheet (OHP) followed by marking with marker and calculated as 2 cm x 3 cm lesion with margins in centimetres on all the sides.

Discharge:

G0 - No discharge.
G1- Non purulent discharge.
G2 - Purulent discharge.

Statistical Method

Paired and Unpaired T test was used to see statistical difference. The observations were mean ± SD. $p<0.05$ was considered as statistically significant. The statistical analysis was performed by using Sigma stat 3.1 software.

Results

Results are shown in Table 1-11 & Fig. 1-5.

Table 1: Sex wise Distribution of disease in the two groups

Group	Male	Percentage	Female	Percentage
Group1 (N=15)	6	40%	9	60%
Group2 (N=15)	4	26.66%	11	73.33%
Total (N=30)	10	33.33%	20	66.67%

Among 30 cases, 10 were males (33.33%) and 20 were females (66.67%). In group 1, 6 were males (40%) and 9 were females (60%). In group 2, 4 were males (26.66%) and 11 were females (73.33%).
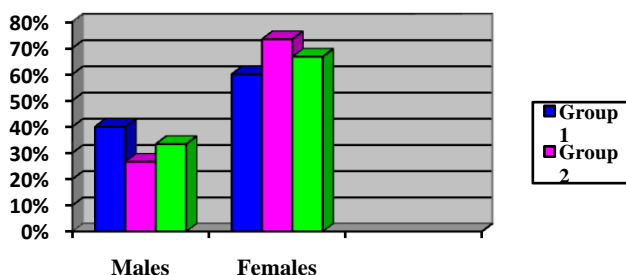
**Figure 1:** Graphical representation of Incidence of Male to female in the study

Table 2: Age wise distribution in the two groups

Age group	Group 1	%	Group 2	%	Total	%
21- 30	5	33.33%	4	26.66%	9	30%
31- 40	4	26.66%	1	6.66%	5	16.66%
41-50	1	6.66%	3	20%	4	13.33%
51-60	5	33.33%	7	46.66%	12	40%

Among 30 cases, 9 (30%) cases were from the age group of 21-30 years, 5 (16.66%) cases were from the age group of 31 – 40 years, 4 (13.33%) cases were from the age group of 41-50 years and 12 (40%) cases were from 51-60 years.

In group 1, 5 (33.33%) cases were from 21-30 years, 4 (26.66%) cases from 31-40 years, 1(6.66%) case was from 41-50 years, and 5 (33.33%) cases were from 51-60 years.

In group 2, 4 (26.66%) cases were from 21-30years, 1 (6.66%) case was from 31-40 years, 3 (20%) cases were from 41- 50 years of age and 7 (46.66%) cases were from 51-60 years.
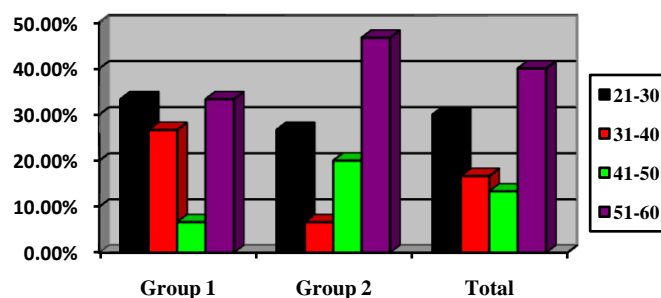
Figure 2: Bar diagram showing the age wise distribution in the two groups

Table 3: Showing degree of pain in both the Groups

	BT				AT 3rd Day				AT 5th Day				AT 7th Day			
	G0	G1	G2	G3	G0	G1	G2	G3	G0	G1	G2	G3	G0	G1	G2	G3
Group1	3	3	7	2	1	6	8	-	6	8	1	-	11	4	-	-
Score	0	3	14	6	0	3	16	0	6	8	2	0	0	4	0	0
Total	23				22				16				4			
Mean	**1.533**				**1.466**				**0.6**				**0.267**			
Group2	4	-	11	-	-	10	5	-	8	6	1	-	14	1	-	-
Score	0	0	22	0	0	10	10	0	0	6	2	0	0	1	0	0
Total	22				20				8				1			
Mean	**1.467**				**1.333**				**0.533**				**0.0667**			

BT-Before Treatment, AT-After Treatment

Table 4: Showing paired sample statistics for pain in both Groups

Group		Mean	N	Std Deviation	Std Error Mean	t	P
G1	BT	1.533	15	0.990	0.256	**6.141**	**<0.001**
	AT	0.267	15	0.458	0.118		
	Difference	1.267	15	0.799	0.206		
G2	BT	1.467	15	0.915	0.236	**5.957**	**<0.001**
	AT	0.0667	15	0.258	0.0667		
	Difference	1.400	15	0.910	0.235		

BT-Before Treatment, AT-After Treatment
p>0.05-Not significant, p<0.05-Significant, p<0.01-Highly significant, p<0.001-Very p<0.05

Effect in Group 1

The mean score symptom of which was 1.533 ± 0.990 Before treatment decreased to 0.267 ± 0.458 After treatment. t = 6.141 with 14 degrees of freedom. (P = <0.001). 95 % confidence interval for difference of means: 0.824 to 1.709. When these values were analyzed statistically by using paired t- test, the difference was significant at the level of P = < 0.001.

Effect in Group 2

The mean score symptom of which was 1.467 ± 0.915 Before treatment decreased to 0.0667 ± 0.258 After treatment. t = 5.957 with 14 degrees of freedom. (P = <0.001). When these values were analyzed statistically by using t- test, the difference was significant at the level of P = < 0.001. 95 %confidence interval for difference of means: 0.896 to 1.904.

Table 5: Showing 't' – test (unpaired) , After treatment in between Group 1 & Group 2.

Group	N	Mean	Std Deviation	Std Error Mean	t	P	Difference
Group 1	15	0.267	0.458	0.118	1.474	0.152	0.200
Group 2	15	0.0667	0.258	0.0667			

The difference in the mean values of the two groups is not great enough to reject the possibility that the difference is due to random sampling variability. There is not a statistically significant difference between the input groups P = 0.152. 95 % confidence interval for difference of means: -0.0780 to 0.478.
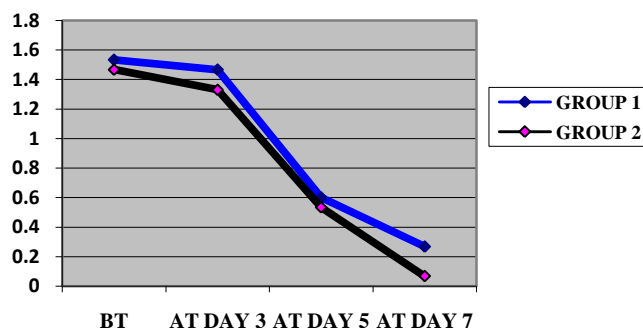
Figure 3: Graphical representation showing the Mean of pain in both Groups.

Table 6: Showing degree of Burning sensation in both Groups

	BT				AT 3rd Day				AT 5th Day				AT 7th Day			
	G0	G1	G2	G3	G0	G1	G2	G3	G0	G1	G2	G3	G0	G1	G2	G3
Group 1	15	-	-	-	5	8	2	-	13	2	-	-	15	-	-	-
Score	0	0	0	0	0	8	4	0	0	2	0	0	0	0	0	0
Total	0				12				2				0			
Mean	**0**				**0.8**				**0.133**				**0**			
Group 2	13	2	-	-	5	10	-	-	15	-	-	-	15	-	-	-
Score	0	2	0	0	0	10	0	0	0	0	0	0	0	0	0	0
Total	2				10				0				0			
Mean	**0.133**				**0.66**				**0**				**0**			

BT-Before Treatment, AT-After Treatment

Table 7: Showing Paired sample statistics for degree of Burning sensation

Group		Mean	N	Std Deviation	Std Error Mean	t	P
Group 1	BT	0	15	0	0	-1.468	***0.164
	AT	0.133	15	0.352	0.0909		
	Difference	-0.133	15	0.352	0.0909		
Group 2	BT	0.133	15	0.352	0.0909	1.468	***0.164
	AT	0	15	0	0		
	Difference	0.133	15	0.352	0.0909		

BT-Before Treatment, AT-After Treatment
*p>0.05-Not significant, **p<0.05-Significant, ***p<0.01-Highly significant, **** p<0.001-Very p<0.05

Effect in Group 1

The mean score symptom of which was 0.000±0.133 Before treatment was 0.133±0.352 After treatment. t = -1.468 with 14 degrees of freedom. (P = 0.164). 95 % confidence interval for difference of means: -0.328 to 0.0615. When these values were analyzed statistically by using paired t- test, the difference was significant at the level of P =0.164.

Effect in Group 2

The mean score symptom of which was 0.133 ± 0.352. Before treatment decreased to 0 After treatment. t = 1.468 with 14 degrees of freedom. (P = 0.164). 95 % confidence interval for difference of means: -0.0615 to 0.328 When these values were analyzed statistically by using t- test, the difference was significant at the level of P = 0.164.

Table 8: Showing 't' – test (unpaired), After treatment in between Group 1 & Group 2

Group	N	Mean	Std Deviation	Std Error Mean	t	P	Difference
Group 1	15	0.133	0.352	0.0909	1.468	0.153	0.133
Group 2	15	0	0	0			

It was observed that the Group 1 and Group 2 are compared using unpaired t – test. The difference in the mean values of the two groups is not great enough to reject the possibility that the difference is due to random sampling variability. There is not a statistically significant difference between the input groups P = 0.153.). 95 % confidence interval for difference of means: -0.0615 to 0.328
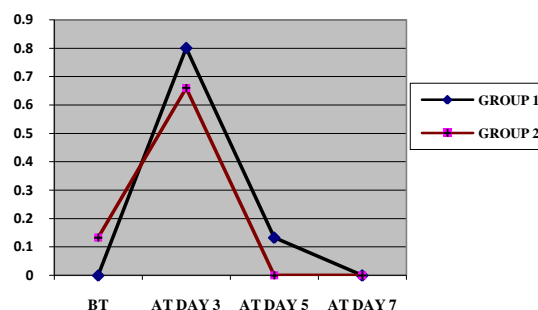
Figure 4: Graphical representations showing the Mean of Burning sensation in both the Groups

Table 9: Showing degree of Regression of lesion in size in both Groups

	BT				AT 3rd Day				AT 5th Day				AT 7th Day			
	G0	G1	G2	G3	G0	G1	G2	G3	G0	G1	G2	G3	G0	G1	G2	G3
Group 1	-	2	10	3	-	2	11	2	-	6	8	1	4	9	2	-
Score	0	2	20	9	0	2	22	6	0	6	16	3	0	9	4	
Total	31				30				25				13			
Mean	2.067				2				1.66				0.867			
Group 2	-	1	13	1	-	1	13	1	-	6	9	-	1	10	4	-
Score	0	1	26	3	0	1	26	3	0	6	18	0	0	10	8	0
Total	30				30				24				18			
Mean	2				2				1.6				1.2			

BT-Before Treatment, AT-After Treatment
p>0.05-Not significant, p<0.05-Significant, p<0.01-Highly significant, p<0.001-Very p<0.05

Table 10: Showing Paired sample statistics for degree of Regression of lesion in size

	Group	Mean	N	Std Deviation	Std Error Mean	t	P
G 1	**BT**	2.067	15	0.594	0.153	**11.225**	**<0.001**
	AT	0.867	15	0.640	0.165		
	Difference	1.200	15	0.414	0.107		
G 2	**BT**	2.000	15	0.378	0.0976	**7.483**	**<0.001**
	AT	1.200	15	0.561	0.145		
	Difference	0.800	15	0.414	0.107		

BT-Before Treatment, AT-After Treatment
p>0.05-Not significant, p<0.05-Significant, p<0.01-Highly significant, p<0.001-Very p<0.05

Effect in Group 1

The mean score symptom of which was 2.067± 0.594 Before treatment decreased to 0.867±0.640 After treatment. t = 11.225 with 14 degrees of freedom. (P = <0.001). 95 % confidence interval for difference of means: 0.971 to 1.429. When these values were analyzed statistically by using paired t- test, the difference was significant at the level of P = < 0.001.

Effect in Group 2

The mean score symptom of which was 2.000±0.378 Before treatment decreased to 1.200±0.561 After treatment. t = 7.483 with 14 degrees of freedom. (P = <0.001). 95 % confidence interval for difference of means: 0.571 to 1.029. When these values were analyzed statistically by using t- test, the difference was significant at the level of P = < 0.001.

Table 11: Showing 't' – test (unpaired) , After treatment in between the Group 1 & Group 2
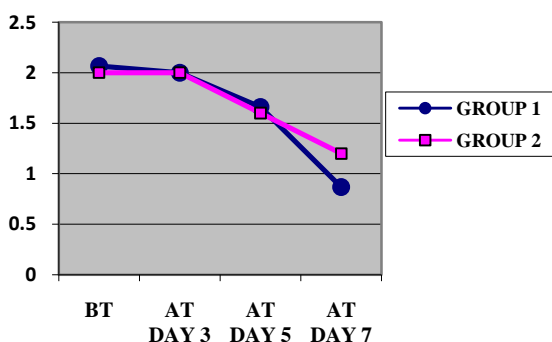
Group	N	Mean	Std Deviation	Std Error Mean	t	P	Difference
Group 1	15	0.867	0.640	0.165	**-1.517**	******0.140**	**-0.333**
Group 2	15	1.200	0.561	0.145			

p>0.05-Not significant, p<0.05-Significant, p<0.01-Highly significant, p<0.001-Very p<0.05

The difference in the mean values of the two groups is not great enough to reject the possibility that the difference is due to random sampling variability. There is not a statistically significant difference between the input groups, P = 0.140. 95 % confidence interval for difference of means: -0.783 to 0.117.

Figure 5: Graphical representation showing the Mean of Regression of lesion in size in both Groups

Discussion

As mentioned in our classical text, kshara acts by Vranashotha pachana- reduce the size of lesion,Vilayana- having properties of ushna, tikshna, hence it can melt kapha vata vibandha, Dharana- helps in bursting of wounds with large pus pockets, Vrana shodhana and ropana- healing of wounds, Vrana kleda soshana- reduce itching sensation and Sthambana- reduce bleeding16.

Hence we tried to evaluate the efficacy of Pratisaraneeya apamarga and pratisaraneeya palasha kshara in patient with Charmakeela and Kadara (warts and corns).

We have considered the cases of warts and corns present in the body apart from sensitive parts like genitals, eye lids, lips etc based on exclusion criteria. The result of our study reveals that, 6 patients of warts and 4 patients of corns had a reduction in pain, burning sensation, discharge and complete regression of lesion, two patients of warts and one patient of corns had scarring on 7th day, one patient each from warts and corn had recurrence after 8 weeks in Group 1, whereas four patients of warts and four patients of corns had complete regression of lesion, three patients of warts and one patient of corn had scarring on 7th day, two patients of warts and one patient of corn had recurrence after 4 weeks in Group 2. We found that, out of nine cases of warts, five were found on foot, three were found on the hands and one case presented on the neck whereas all the six cases presented the corns on the sole of the foot in Group 1. In Group 2, four cases presented warts on the foot and five cases presented on the hands whereas remaining six cases presented corns on sole of the foot.

It was interesting to see that, even though the scarring was seen in few patients, the size of the scar was lesser than the lesion existed before in Group 1 (pratisaraneeya Apamarga kshara) compared to Group 2 (pratisaraneeya Palasha kshara). It was also encouraging that the scar was acceptable by the patients in comparison with the original lesion in our study. Pratisaraneeya Apamarga kshara showed greater improvement in Charmakeela and Kadara (warts and corns) when compared

to pratisaraneeya palasha kshara. Even though scarring was seen in a few patients, the size of the scar was lesser than the lesion existed before in Group 1 compared to Group 2. The scar was acceptable by the patients in comparison with the original lesion.

Conclusion

Pratisaraneeya Apamarga kshara showed greater improvement in corns and warts when compared to pratisaraneeya Palasha kshara. In the management of the Charmakeela and Kadara, the procedures described concerned to kshara karma in our classical text are found to be beneficial as evident from our study. However we opine that, after application of kshara, dressing and following proper post treatment care also plays an important role to reduce scar formation. Internal medications to aid the healing process also should be considered for preventing the recurrence.

Acknowledgement

References

1. Khopar U. An Illustrated Hand book of Skin Diseases and Sexually Transmitted Infections. 6th ed. India: Bhalani Publishers.6th ed. 2009; 63–9.

2. Sharma Priya Vrat., editor. Sushruta, Sushruta samhita, Nidanasthana, Arsharoga Nidana Adhyaya.. Varanasi: Chukhamba Visvabharati; 2005; 1st ed. 18(2): 24.

3. Ibid, Sushruta samhita (1), Nidanasthana, Arsharoga Nidana Adhyaya. 2(19-20):24.

4. Sharma Anant Ram., Dr, editor. Sushruta, Sushruta samhita, Chikitsasthana, Arsha Chikitsa Adhyaya.. Varanasi: Chaukhamba Sura Bharati Prakashan; 2001; 1st ed. 20:6

5. Upadhyaya Vaidya Yadunandana. Varanasi: Chaukhamba Prakashan. Vagbhata, Ashtanga Hrudaya, Nidanasthana, Arshanidana Adhyaya. edited with Vidyotini Hindi Commentary by Kaviraj Atrideva Gupta.2001;57:7

6. Murphy GA. Lesser Toe Abnormalities: Corns (Helomata and Clavi). In: Canale ST, ed. Canale: Campbell's Operative Orthopaedics. 10th. St. Louis, Mo: Mosby; 2003:4063-5.

7. Singh D, Bentley G, Trevino SG. Callosities, corns, and calluses. BMJ. Jun 1 1996; 312(7043):1403-6.

8. Freeman DB. Corns and calluses resulting from mechanical hyperkeratosis. Am Fam Physician. Jun 1 2002;65(11):2277-80.

9. Kaviraj Dr.Ambikadattashashri. Sushruta Samhita, with Hindi translation of text. Reprint- 2008. Varanasi: Chaukhamba Sanskrit Sansthan, Purvardha-Nidan Sthana, Chapter-13, Sloka-29, 30, p.284.

10. Dr.Anna Moreswar Kunte and Pandit Krushna Shashrinavare. Ashatanga Hrdaya, with Sanskrit text. Reprint- 2011. Varanasi: Chaukhamba Sanskrit Sanstan; Uttarardha, Chapter-31, Sloka-21, p.889.

11. R.C.G. Russell, Norman S.Williams, Christopher J.K. Bulstrode. Bailey & Love's Short Practice of Surgery. 23rd ed. London: Hodder Education; 2000. Chapter 13th, p. 173.

12. Dr. S. Das. A Concise textbook of Surgery. 6th ed. Kolkata (India): Published by Dr. S. Das; July 2010.Chapter 21st, p.291. Acharya Priyavat Sharma. Kaiyadeva Nighantu, with Hindi translation. 1st Edition 1979, Varanasi:Chaukhamba Orientalis; Chapter-1, Sloka-1034, p. 191.

13. Acharya Priyavat Sharma. Kaiyadeva Nighantu, with Hindi translation. 1st Edition 1979, Varanasi:Chaukhamba Orientalis; Chapter-1, Sloka-1034, p. 191.

14. Shastri Ambikadata. Varanasi: Chaumbika Sanskrit Sansthan; Sushrutacharya Sushruta samhita, Ayurved Tatva Sandipika. 2001;5(6): 36.

15. Susrutha samhitha with Dulhana commentary edited by Priyavata Sharma Varanasi Choukamba Orientalia, 1st edition, 1999; Sutra sthana Chapter 11, Shloka 29.

16. Sahasrabuddhe Gowri d, Joshi Mohan R. Review of Kshara chikitsa. International Ayurvedic Medical journal. 2014; 2 (2):155-160.